



SANYO Semiconductors

DATA SHEET

VEC2904

PNP Epitaxial Planar Silicon Transistor
P-Channel Silicon MOSFETGeneral-Purpose Switching Device
Applications

Features

- Composite type, facilitating high-density mounting.
- Mounting height 0.75mm.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
Collector-to-Base Voltage	V _{CB0}		-30	V
Collector-to-Emitter Voltage	V _{CEO}		-30	V
Emitter-to-Collector Voltage	V _{ECO}		-6.5	V
Emitter-to-Base Voltage	V _{EBO}		-5	V
Collector Current	I _C		-3	A
Collector Current (Pulse)	I _{CP}		-5	A
Base Current	I _B		-600	mA
Collector Dissipation	P _C	When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit	1.1	W
Junction Temperature	T _J		150	°C
Storage Temperature	T _{stg}		-55 to +150	°C
[FET]				
Drain-to-Source Voltage	V _{DSS}		-12	V
Gate-to-Source Voltage	V _{GSS}		±8	V
Drain Current (DC)	I _D		-4	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	-16	A
Allowable Power Dissipation	P _D	When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit	1.1	W
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +150	°C

Marking : AH

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Electrical Characteristics at Ta=25°C

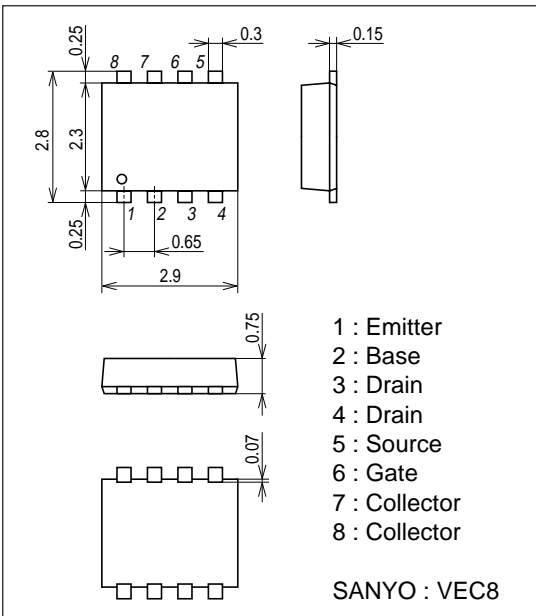
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I_{CBO}	$V_{CB}=-30V, I_E=0A$			-0.1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=-4V, I_C=0A$			-0.1	μA
DC Current Gain	h_{FE}	$V_{CE}=-2V, I_C=-500mA$	200		560	
Gain-Bandwidth Product	f_T	$V_{CE}=-10V, I_C=-500mA$		380		MHz
Output Capacitance	C_{ob}	$V_{CB}=-10V, f=1MHz$		25		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C=-1.5A, I_B=-30mA$		-160	-235	mV
	$V_{CE(sat)2}$	$I_C=-1.5A, I_B=-75mA$		-110	-160	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-1.5A, I_B=-30mA$		-0.83	-1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-10\mu A, I_E=0A$	-30			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1mA, R_{BE}=\infty$	-30			V
Emitter-to-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_C=-10\mu A, R_{CB}=\infty$	-6.5			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-10\mu A, I_C=0A$	-5			V
Turn-ON Time	t_{on}	See specified Test Circuit.		50		ns
Storage Time	t_{stg}	See specified Test Circuit.		270		ns
Fall Time	t_f	See specified Test Circuit.		25		ns
[FET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0V$	-12			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-12V, V_{GS}=0V$			-10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 6.4V, V_{DS}=0V$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-6V, I_D=-1mA$	-0.3		-1.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-6V, I_D=-2A$	4.5	7.6		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-2A, V_{GS}=-4.5V$		37	49	m Ω
	$R_{DS(on)2}$	$I_D=-1A, V_{GS}=-2.5V$		54	75	m Ω
	$R_{DS(on)3}$	$I_D=-0.3A, V_{GS}=-1.8V$		76	107	m Ω
Input Capacitance	C_{iss}	$V_{DS}=-6V, f=1MHz$		940		pF
Output Capacitance	C_{oss}	$V_{DS}=-6V, f=1MHz$		230		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=-6V, f=1MHz$		180		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		14		ns
Rise Time	t_r	See specified Test Circuit.		120		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		97		ns
Fall Time	t_f	See specified Test Circuit.		110		ns
Total Gate Charge	Q_g	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-4A$		11		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-4A$		1.6		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-4A$		2.8		nC
Diode Forward Voltage	V_{SD}	$I_S=-4A, V_{GS}=0V$		-0.85	-1.2	V

Note : The specifications shown above are for each individual transistor.

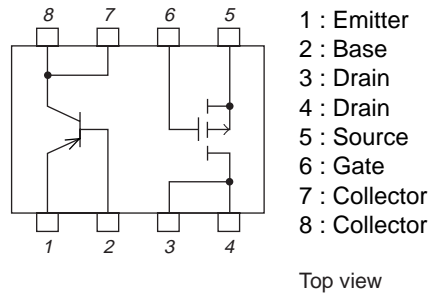
Package Dimensions

unit : mm (typ)

7012-010



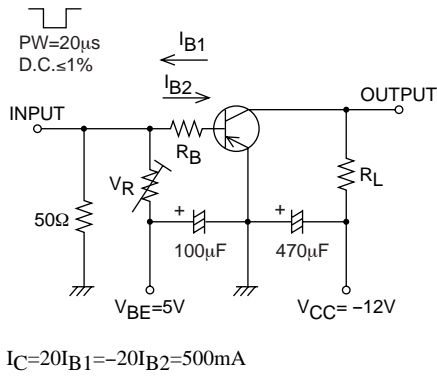
Electrical Connection



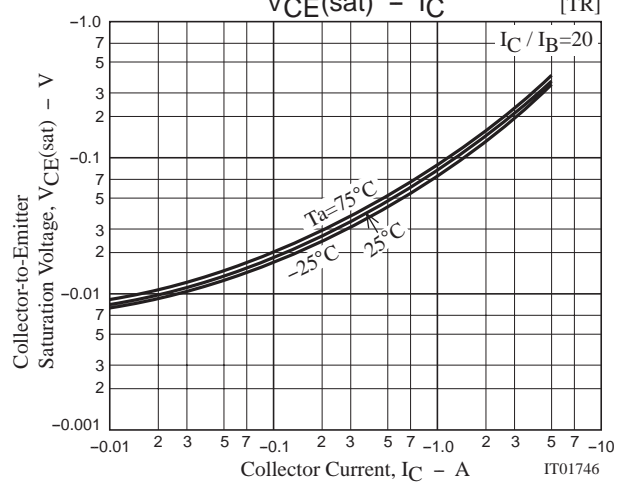
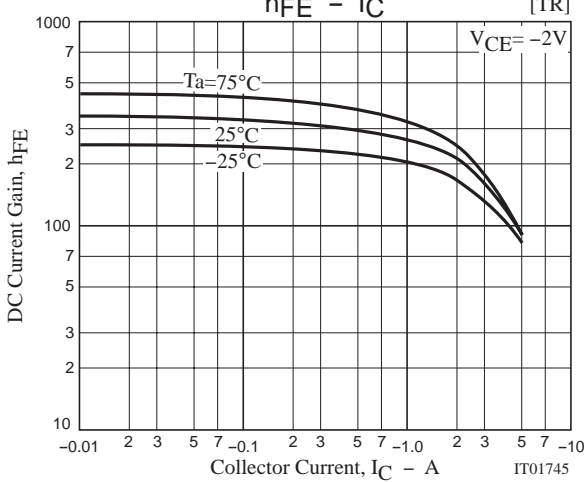
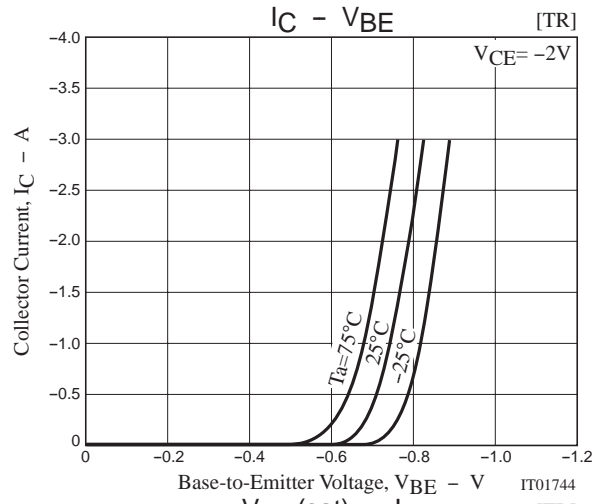
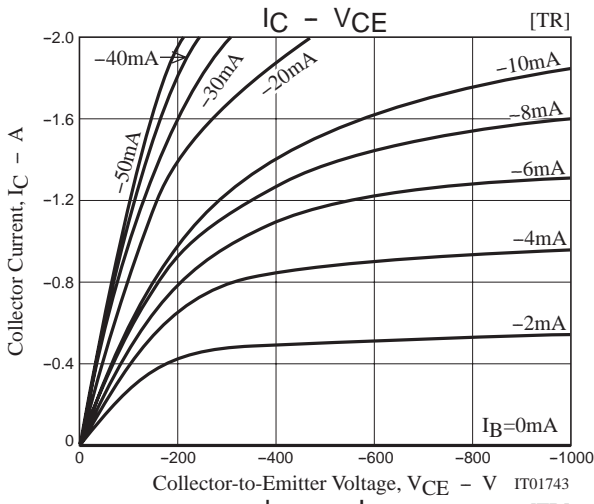
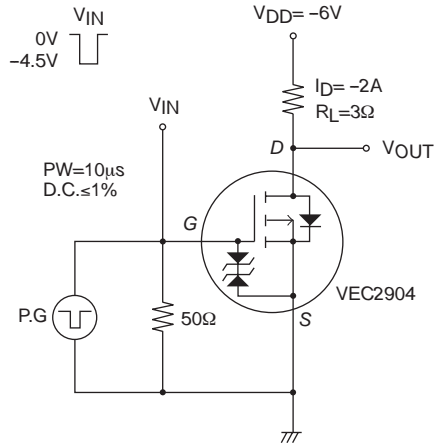
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Switching Time Test Circuit

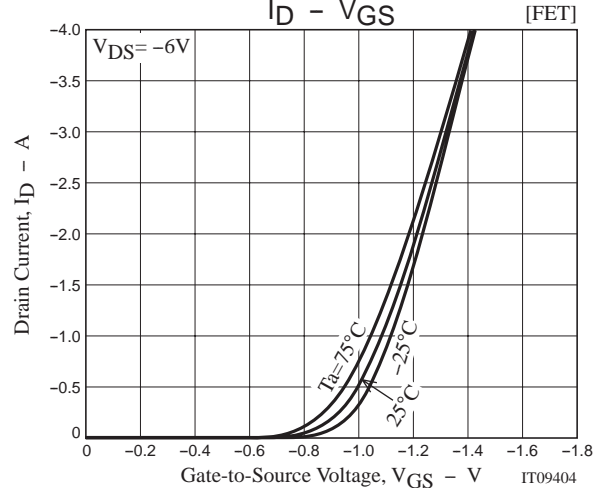
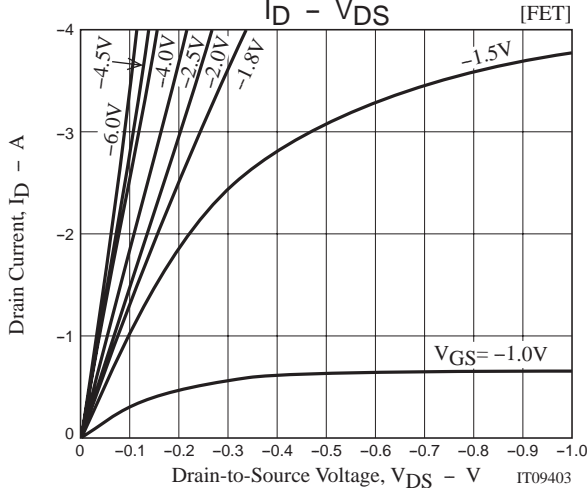
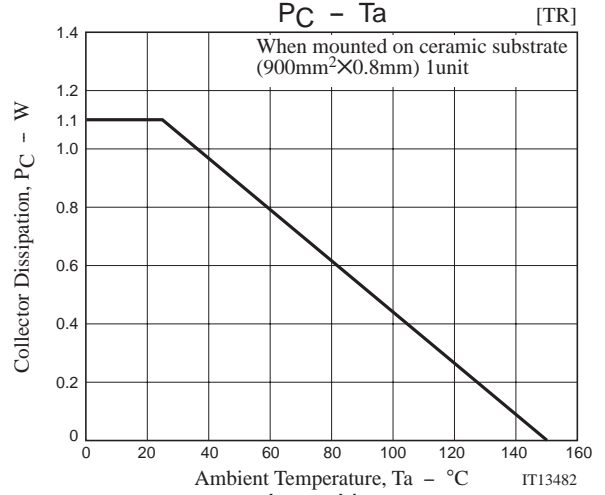
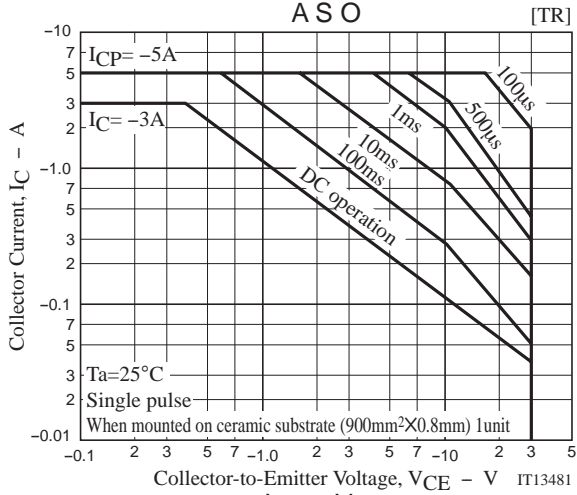
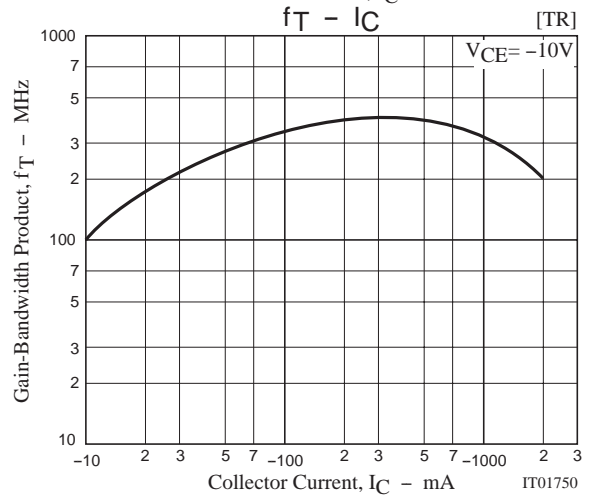
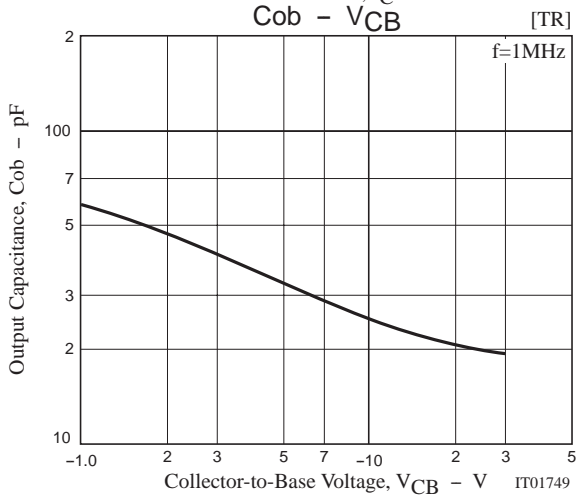
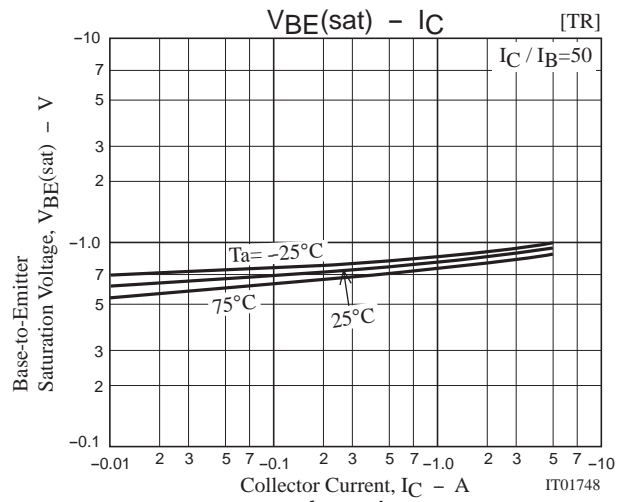
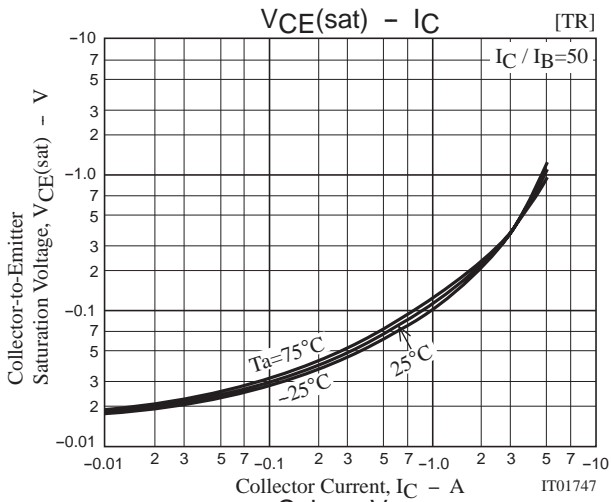
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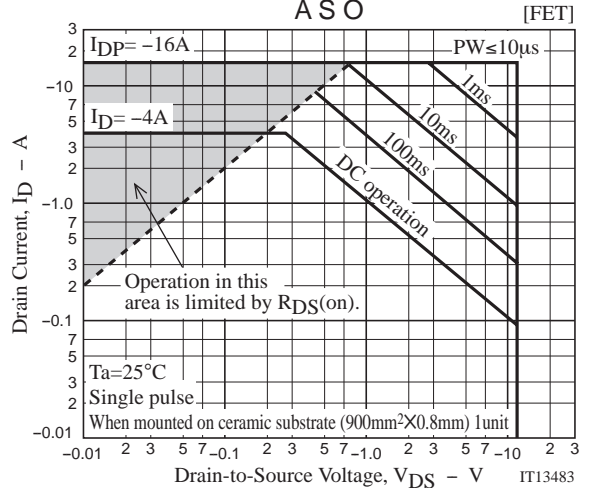
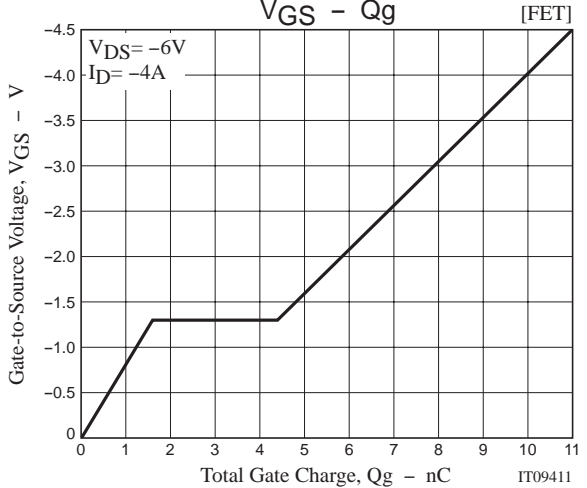
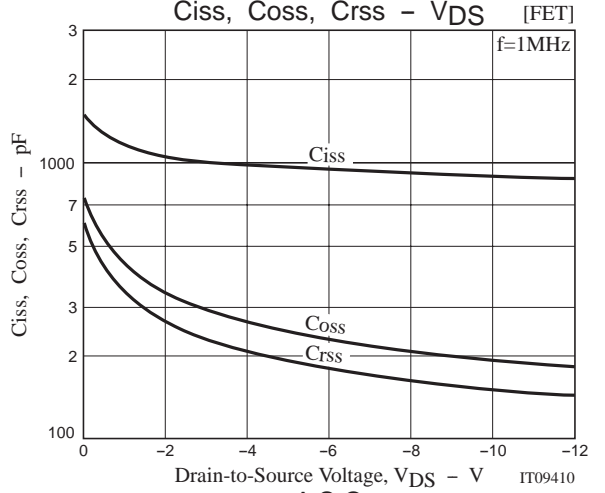
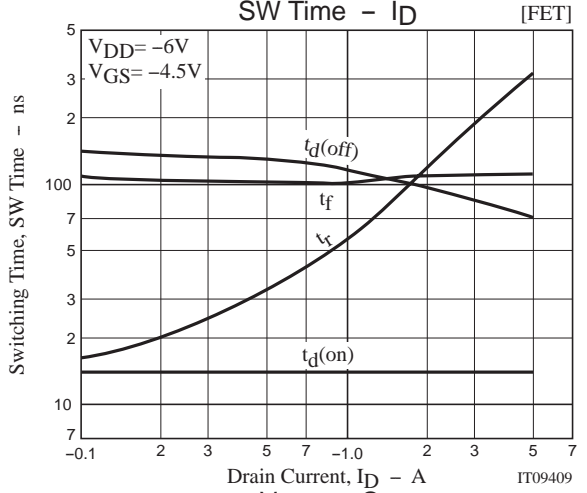
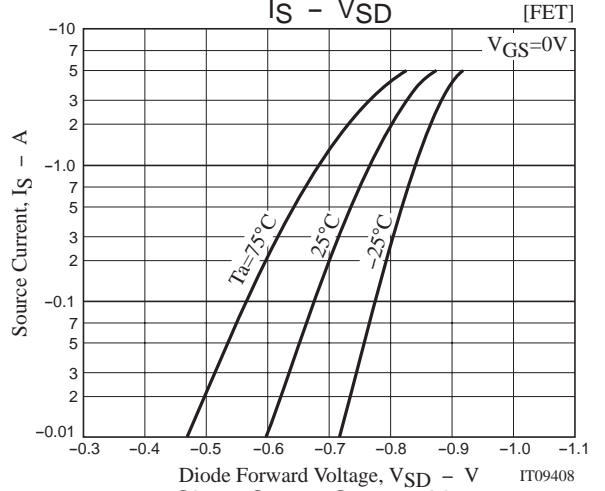
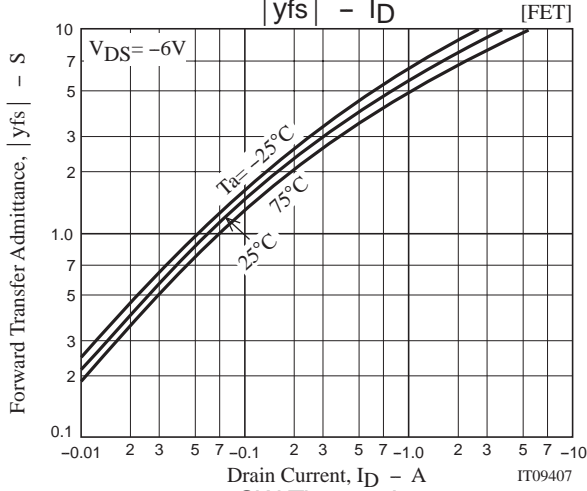
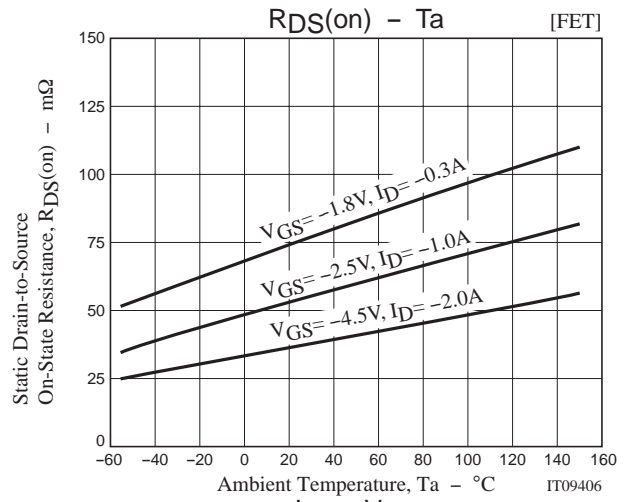
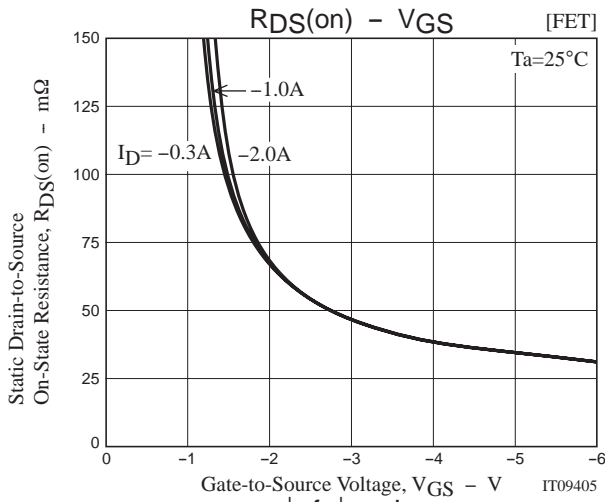
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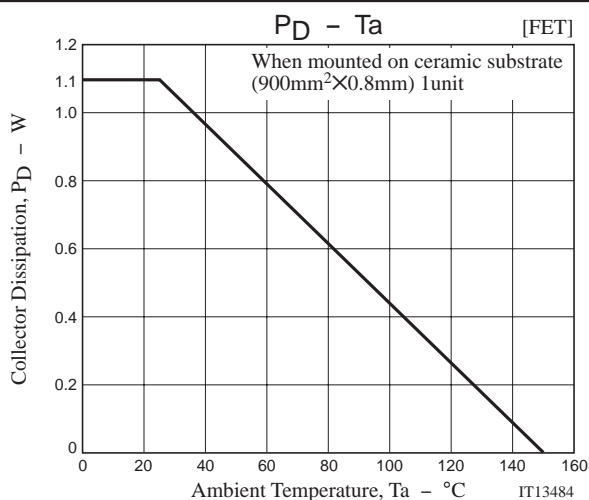
VEC2904



VEC2904



VEC2904



Note on usage : Since the VEC2904 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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